



Release Notes

ION Dx1x1x0-195/30-x version 1.2

Document last updated: 12/21/2009

Product name: ION (DC Brush, Brushless DC, Microstepping)

Source control archive name: 991100051

Date of build: 12/09/2009

Device Checksum: 0xFD9DB0B7

Description:

This document details bug fixes and changes for this release. This release incorporates all improvements made for version 1.1, which was not released.

Known Issues:

The current C-Motion release does not define enumeration values to be used with the GetFOCValue and GetCurrentLoopValue commands for retrieving I2t energy. The correct values are documented in the ION Digital Driver User's Manual; they are:

- o PMDCurrentLoopValueNodeI2tEnergy = 0x000A
- o PMDFOCValueNodeI2tEnergy = 0x000A

Home, Index or HSC captures cannot be triggered more frequently than every 52 microseconds.

Tracing PhaseCommand A/B always returns zero when CurrentControlMode is set to "FOC", even when Current Loop is disabled. This is an intended feature. Setting CurrentControlMode to "FOC", whether or not the current loop is enabled, causes space vector PWM to be used instead of triangular carrier PWM. The PhaseCommand A/B trace variables are not well-specified for SVPWM.

FOC Alpha and Beta (non-rotating frame) outputs may be traced when using FOC mode.

Incompatibilities with previous version:

Space vector PWM modulation has been increased, see issue 64 below. Current and position loop settings may have to be changed.

The default over temperature limit is now 80°C, see bug 11211 below.

SignalStatus changes in dual encoder mode, see bug 27 below

I²t values are changed, see protection mechanism changes below.



Changes/Fixes:

Command Changes

60	Added option to GetFOCValue and GetCurrentLoopValue commands to retrieve I2t energy.
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Communication Changes

	None
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Protection Mechanism Changes

	None
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Commutation Changes

40	Fixed glitch in current control that could occur when PWM and current loop were enabled simultaneously. Now waits 10 current loop cycles after enabling PWM to enable current loop.
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Servo Filter Changes

	None
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Drive Operation Changes

64	Space vector PWM modulation has been increased by approximately 7 % for brushless DC motors, providing higher current gain for the same bus voltage. Space vector PWM is used when the current control mode is set to 1, whether or not the current loop is enabled.
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Registers and Signals Changes

62	Fixed bug in communication with the I2C temperature sensor(s) that could result in losing control of the temperature sensors and LED controller.
98	Fixed issue with I2C communication that kept the data line in an undefined logic state for approximately 50 usec during each temperature sensor query.

Position Loop Changes

	None
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Miscellaneous Changes

	None
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Changes/Fixes in version 1.1:

Command Changes

	None
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Communication Changes

	None
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Protection Mechanism Changes

11212	When using Hall commutation the maximum current when in current foldback was too high. It is now correct.
11211	The default over temperature limit was 70°C, it has been changed to 80°C.
	It foldback defaults and limits for total energy have been reduced. For BLDC, the new default is $68 A_{rms}^2 \text{ sec}$, the limit is $101 A_{rms}^2 \text{ sec}$. For DC, the new default is $150 A_{rms}^2 \text{ sec}$, the limit is $203 A_{rms}^2 \text{ sec}$. For microstep, the new default is $101 A_{rms}^2 \text{ sec}$, the limit is $125 A_{rms}^2 \text{ sec}$. These values are summarized in table 3.3.4.2 in the ION Digital Drive User's Manual revision 1.5, November 2008, for values.

Commutation Changes

22	Issuing an InitializePhase command if Hall commutation was specified would change the commutation mode to sinusoidal. InitializePhase is now a no-op if Hall commutation is specified.
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Servo Filter Changes

11210	ClearPositionError could cause derivative kick. Clearing the position error no longer causes a spike in the derivative control term.
90172	Tracing actual position now traces values with units of counts if the ActualPositionUnits flag is set. Previously it always used units of steps.

Drive Operation Changes

	None
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Registers and Signals Changes

27	In dual encoder mode the state of the auxiliary index input (HSC input) was reflected in the primary axis SignalStatus register, and not the auxiliary axis SignalStatus register. In this release, in dual encoder mode, the Index bit of the primary axis SignalStatus register is always clear, and the auxiliary encoder index status is indicated by the Index bit of the auxiliary axis SignalStatus register.
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Position Loop Changes

26	Phase correction was not applied until a SetPhaseCorrectionMode 1 command was
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	issued, although it was documented as default. In dual encoder mode auxiliary axis capture did not work unless a SetPhaseCorrectionMode 1 command had been issued. Phase correction now works by default, and auxiliary axis capture is independent of phase correction mode.
90180	The commanded position was sometimes incorrectly rounded for non-unity step-to-count ratios. It is now correctly rounded.

Miscellaneous Changes

3	The previous version of this unit sometimes reported "Internal Logic Fault" after power cycle, incorrectly indicating a problem with an internal 5 Volt supply. This has been fixed.
21	The delay following a commanded reset was long enough that host communication was often lost. Reset is now fast enough that communication should not be lost.
34	I2C is used internally for communication with temperature sensors, EEPROM, and the LED controller. In version 5.0 there were some I2C protocol violations, which are fixed.